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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,443	07/22/2004	Chin-Yee Ng	57391US003	5326
32692 7590 08/21/2007 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427				
			EXAMINER CHU, HELEN OK	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 08/21/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/502,443	Applicant(s) NG ET AL.	
	Examiner Helen O. Chu	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 3/27/07; 6/28/07.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) 32-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. Applicant's Amendments have been received on June 28, 2007. Claim 1 has been amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

### ***Continued Examination Under 37 CFR 1.114***

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 28, 2007 has been entered.

### ***Claim Rejections - 35 USC § 103***

1. The rejections under 35 U.S.C 103 (a), on claims 1-15, 17, 20-24, 27-3, as unpatentable by Verhoog in view of Brinkman et al. are withdrawn because Applicant has amended claim 1.
2. The rejection under 35 U.S.C 103 (a), on claim 16, as unpatentable by Verhoog in view of Brinkman et al. in further view of Fitts et al. is withdrawn because Applicant has amended claim 1.

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3. The rejections under 35 U.S.C 103 (a), on claims 25 and 26, as being unpatentable over in view of Brinkman et al. in further view of Gyoten et al. are withdrawn because Applicant has amended claim 1.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-15, 17-24, 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315).

In regards to claim 1 and 14, Verhoog teaches each of the electrochemical cells comprising opposing first and second planar surfaces (Figure 4) and being subject to volumetric changes during charge cycling (Column 1, Lines 24-25) with a unitary cooling tank (Figure 4) which is external to the electrochemical cells, formed of a polypropylene (Column 4, Line 40) plastic material (Column 2, Line 46) and having an inlet fluid orifice and an outlet fluid orifice (Column 2, Lines 34-36), the cooling bladder having a substantially flat shape (Figure 4) and circulates liquid between the inlet and outlet (Column 1, Lines 55-60). However, the Verhoog reference does not disclose a deformable bladder. The Brinkman et al. discloses a cooling bladder made of plastic preferably polyethylene because of its relatively good heat conductivity accompanied by high specific conductivity (Column 4, Lines 15-18). Therefore, it would have been

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obvious to one of ordinary skill at the time the invention was made to incorporate a deformable (because it is a bladder) polyethylene plastic, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

In regards to claims 2-7, 10 and 23, the Verhoog et al. teaches a cooling tank, which covers all the surface area of the electrochemical cells with continuous and hollow interior flanges (Applicant's flow channels), which the medium passes (Figure 3 and 4). The cooling tank comprises serpentine ribs (Applicant's support arrangement and thickened sections; Column 5, Line13; Component 41) located on the outer surface and at bends of the tank that inhibits restriction of cooling medium (Figure 4).

In regards to claims 8 and 9, the Verhoog et al. teaches an electrolyte that fills the cells and disposed at all areas of the cell (Column 4, lines 47-49).

In regards to claims 11-13, The Verhoog et al. reference teaches a plurality flanges that causes the fluid flowing in the compartment to flow alternatively in the opposite direction (Column 3, Lines35-37).

In regards to claim 15, the Verhoog et al. reference teaches a tank made of a plastic material and each flange of the tank is stacked one on top of each other. Together, all the polypropylene material forms a plurality of material layer.

In regards to claim 17, the Verhoog et al. reference teaches the polypropylene tank which consist of ribs have the height of 3mm to 4mm (Column 5, Lines 15-16).

In regards to claim 20-22 and 27, the Verhoog et al. reference teaches an electrochemical assembly uniformly cooled (Column 1, Lines 44), hence, there will not be any temperature difference and the heat transfer medium entering the electrochemical cell has to be constant.

In regards to claim 24 and 28-31, the Verhoog et al. reference teaches a nickel metal hydride (Column 1, Line 21); it is inherent for a nickel metal hydride to operate between 20°C to 130°C. The Verhoog et al. reference illustrates four edges of which the cooling tank contacts (Figure 1) and a housing incorporates two orifices for each cell respectively receiving a terminal of each polarity (Column 4, Lines 45-47) and a manifold that has an inlet and outlet manifold (Figure 1).

In regards to claim 18, the Verhoog and Brinkman et al. reference discloses the claimed invention except for a plurality of cooling tanks. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of cooling tanks, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. (MPEP 2144.04 VI).

In regards to claim 19, the Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein. It would have been obvious if the electrochemical cell ran for a long period of time, the heat transfer medium would be consumed and would eventually be less than 50% by volume or weight.

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6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315) as applied to claims 1-13, 19-24, 27-31 and in further view of Fitts et al. (US 2002/015333).

The Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein, however, the Verhoog and Brinkman et al. reference does not teach a thermally conductive material comprises a metallic layer disposed between a first polymer layer and a second polymer layer. The Fitts et al. reference teaches a core material that is made of metallic, non-metallic or metallic with non-metallic materials that have a high thermal conductivity. Therefore, it would be obvious to one skilled in the art at the time the invention was made to incorporate a layer of metallic, non-metallic or metallic with non-metallic material into the heat transfer system as taught by Verhoog and Brinkman et al. to insure the system is transferring heat efficiently.

7. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verhoog (US Patent 6,296,968 B1) in view of Brinkman et al. (US Patent 4,007,315) as applied to claims 1-13, 19-24, 27-31 and in further view of Gyoten et al. (US 2001/0036567).

The Verhoog and Brinkman et al. reference teaches the elements of claims 1-13, 19-24, 27-31 and incorporated herein, however, the Verhoog and Brinkman et al. reference does not teach a coolant to be water or aqueous ethylene glycol. The Gyoten et al. reference teaches water or aqueous ethylene glycol to be a coolant in order to prevent destruction of the cell by varying temperatures (Paragraph 47).

***Response to Arguments***

8. Applicant's arguments filed March 27, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

a. Clearly Brinkman et al. has a limitation of having the cooling bladder situated within the electrolyte and , furthermore, inside of the electrochemical cell. In order to established a prima facie case of obviousness of a claim, all the claim limitations must be taught or suggested by the prior art. Neither, Verhoog, nor Brinkman suggest that the cooling bladder is external to the electrochemical cells.

In response to Applicant's arguments.

a. The Verhoog reference has a cooling tank external the electrochemical cells. Column 2, Lines 44-47 states "the one-piece battery of the invention comprises a tank that is generally, although not exclusively, made of plastic material. The tank is divided into cells by walls, each cell receiving an electrode assembly." This clearly indicates to one of ordinary skill that the tank is external to the electrochemical cell because the cells are divided by walls.

Electrochemical cells are known to one of ordinary skill in the art to have at a minimum a positive electrode, a negative electrode and electrolyte or the electrode assembly as disclosed by the Verhoog reference. The Examiner used the Brinkman et al. reference to disclosed another plastic type material deformable such as a bladder can be used in cooling systems. The Examiner did



not rely on the Brinkman reference for the recitation "external to the electrochemical cells."


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOC

  
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PRIMARY EXAMINER  
8/07